Journal of Universal Computer Science, vol. 23, no. 12 (2017), 1238-1255
submitted: 13/3/17, accepted: 24/8/17, appeared: 28/12/17 © J.UCS

A Dilemma on "Web-based/Mobile Assessment" by or for Teachers: A Content Analysis

Eser Çeker
(Near East University, Nicosia, North Cyprus, Mersin 10, Turkey
eser.ceker@neu.edu.tr)

Hüseyin Uzunboylu
(Near East University, Nicosia, North Cyprus, Mersin 10, Turkey
huseyin.uzunboylu@neu.edu.tr)

Abstract: The aim of this study was to examine the research of open access studies conducted and published in 'Web of Science' indexed electronic journals and publications, as well as Master & Doctorate level open thesis studies from PQDT Open, OADT Org., EthOS and Council of Higher Education Thesis Center-Turkey on "web based/mobile teacher assessment". The total number of articles reached was 1330. According to the results depending on selected variables, there is a clear, steady increase in the number of publications on this subject throughout the years, and researchers from USA are the clear leaders in the order list; followed by UK, China, Australia and Taiwan. The leading universities are from USA, Taiwan and UK as well. "Articles", "Proceeding Papers" and "Meeting Abstracts" are the most preferred document types used. Following the number of articles on "computer science" and "engineering" research areas, articles classified to "Educational Research" areas are popular as well. Interestingly, "teacher assessment" oriented articles mostly were more focused to "assessing students by teachers", but very few examples exists for "assessing teachers by students". After this research and the results achieved, the authors of this article has conclusions that sufficient information exists to further study the title subject towards a new PhD study.

Keywords: Web based assessment, mobile assessment, teacher
Categories: L.0.0, L.1.1, L.2.7, L.3.0, L.3.5, L.3.6, K.3.1

1 Introduction

With the improvements in digital technology, the role of teachers in the "teaching and learning process" is changing too. Teachers who follow this projection, are more successful in skills such as counselling, leading and communicating with their students, and have better chances to achieve their targets. Assessment is a fundamental step in the learning process, which is mostly used by teachers to evaluate student success in learning. Now, the necessity of adding both perspectives (teacher's and student's) to the assessment process is needed. This study, aims to identify the characteristics of the recent studies done on "web based/mobile assessment tools", and look for examples on web-based/mobile assessment tools for assessing teacher performance by students.

International Dictionary of Education defines assessment as "the process by which one attempts to measure the quality and quantity of learning and teaching"

[Page & Thomas, 21]. But this definition, neglects considering the intention and opportunities of formative assessment or assessment for learning. As given in Ref. [Sainsbury & Walker, 25], emphasizes some of these possibilities and purposes for learning; recommending that "assessment can be perceived as being a way of understanding learning from the students perspective as well".

At the same time, as stated in [Taras, 30], Taras brings forward the difference between "formative assessment" and "summative assessment". He notes that it is the difference in "focusing on the function" and "purpose of learning". Using Information and Communication Technology (ICT) tools for assessing the work done (which keeps increasing in terms of verity today), includes web-based or mobile assessment materials.

Making use of web based or mobile tools for assessing –not separated from but as an integral part of the assessment process– , introduces new possibilities to advance the validity and collaboration of learners for measuring. But, there are examples which shows that in some cases, it may also add some limitations too [Scanlon, 27].

[Dahalan, 08], defined Web-based assessment as it "is a general term which encompasses computer application and Internet in classroom assessment process". Thus for evaluating various dimensions of learning (such as student needs, student performance, classroom activities, student thinking styles, interaction, online/offline work …etc.); "web-based/mobile assessment" tools can be used by/for all partners in the learning process including supervisors (inspectors), teachers, students and families.

"Mobile assessments allow tutors to review students' progress remotely, and for students to receive more feedback on a more frequent basis" [Coulby, 06].

[JISC, 12], uses a more general form of identification (e-Assessment) which is defined as "e-Assessment is the end-to-end electronic assessment processes where ICT is used for the presentation of assessment activity, and the recording of responses. This includes the end-to-end assessment process from the perspective of learners, tutors, learning establishments, awarding bodies and regulators, and the general public."

As stated in [Ahamer, 01], Ahamer classified the "generations" of web-based learning into three stages. The first stage being "content & quiz", "communication and construction" the second, and "collaboration and mutual assessment" the last. Coherent to the learning historical steps, he also stresses what the overall trend regarding to assessment is by telling that it "consists in a shift of roles: initially, only the lecturer has the power to grade, later on well-defined sub-portions of grading tasks are performed by peer students. Such development is well in line with a finding for another professional field, namely that for the assessment of university studies, both internal and external evaluation is necessary". Unfortunately, the climate and conditions for change in education is not always appropriate, and some recent studies aiming to investigate the level of school, parents and community partnership to enhance the students' learning achievement, give negative results showing that the least participated part was on "evaluation" [Prasertcharoensuk & Tapkawa, 23]. Recently [Traxler, Barcena and Laborda, 34], underlines the importance of the new "mobile assisted learning", "mobile learning research community" concepts, dealing with assessment techniques that are aligned to the new affordances of mobile devices (geo-tagged image capture) [Traxler, Barcena & Laborda, 34].

One of the fundamental disadvantage noted by researchers in regards of using "web-based or mobile assessment" tools, is the attitude of students which fails to notice the advantages of it [Chang, 05]. [Chan, 04], underlined another disadvantage of using it for students especially when it is being used in a "test-only" type of activity. Similar disadvantages are mentioned in some of the "medical" applications too, where it is believed that extra difficulties are introduced to the system just because of this new assessment tools [Sano, 26]. Other researchers such as [Ozdamli , 19], which focused on the "attitudes" in their study, underlines an important finding, a problem maybe, regarding to teacher and student attitudes about one another on willingness to use such devices (tablet PC's, mobile devices etc.) and that the students tends to use them for purposes other than education more. In terms of using new technological devices (such as iPads', mobile devices etc.) in learning, some researchers findings are even more unfavourable which clearly indicates that "the long-term impact" of using such devices could be even negative [Dhir, 09].

Compared with the opposite, majority of the educators are supporting the view that "web-based assessments advantages are more than its shortcomings" [Oz, 20]. Some giving more details about the reasons for this conclusion, such as its "providing minimum resource usage" [Chan, 04]; "its trialability and academic specialization" [Berigel, 03]; "possibilities it introduce to be able to assess in series" [Kruger et al., 17]; and "increased feedback frequency opportunities" [Behnke, 02]. Of course, there are distinct categories of jobs such as policy makers which naturally live the advantages of using computer-driven assessment tools [Croteau, 07].

A non-small "group" of researcher also believes that using "web-based or mobile assessment" tools includes both its advantages and disadvantages within. They continue to say that for each category of application, both should be considered, tested and benefits should be driven from previous results [Fan, 10; Karch, 13; Said, 24; Solomonidou, 29].

A study done in Turkey about perceptions on web-based assessment use for pre-service English teachers shows that there is still a need for investigating what learners think and feel on this and issues related with learning still exists. Results showed that Pre-service teachers, did not favour to totally use web-based form of assessment, but more students preferred a web-based assessment with peer-assessment rather than having only paper-based tests [Oz, 20].

As stated in a study [Dhir, 09] on a web-based model for developing assessment literacy of secondary in-service teachers also give major results generally confirming the effectiveness of model used. Findings showed that the assessment knowledge of the participants has improved after the training. Secondly, their findings also reveal that there was an improvement on teachers' assessment perspectives too.

A study done in Italy, also shows evidence for achieving better school performance results by adding students to the assessment process in the evaluation of classroom, lesson, teacher, and school performance [Palma, 36].

As stated in [Kasapcopur, 14], Kasapcopur et.al., study on introducing a new "e-inspection" model which was started to be used & tested in some Turkish kindergarten schools are still on the pilot application stage. This effort drives its reasoning from the need of increasing the quality of the education at schools in Turkey. The presented new environment, helps trying to make use of a "Performance Assessment System Based on Multiple Data Resources". A web-based e-inspection

model is put into effect for general inspections of school and institutions. The pilot project also aims to establish an economical inspection system, which is more effective, supports self-inspection of schools and, which is based on pluralism and performance. But unfortunately, (possibly reasoning because of the smallness of age groups involved), the evaluators involved are inspectors, provincial managers, administrators, teachers, and parents only. But, not the learners (students) themselves.

A similar research by [Tufekci, 32] studied and evaluated the "usability issues" of Turkish "E-Okul" System as well (which involves assessing various variables in education via web-based tools), with some results indicating that problems exists in the design and navigation platforms. Although in the E-Okul System students are able to retrieve information regarding to their grades, attendance, exam dates, teacher announcements, course schedules, course reading lists, social activities, rewards, and disciplinary actions since registration; no feedback path is identified for assessing teacher performance via student evaluations.

A diverse study established by [Fulgham, 11], investigating many critical dimensions of "Student Evaluation of Teaching (SET)" (whose results naturally will affect the authors of this articles too), was done for the higher education category in USA recently. Fulgham, with much evidence, clearly states that although lots of research exists for Student Evaluation of Faculty (SEF), not many were comprehensive. His study shows that "Faculty generally believes that SEF provide valuable information to the individual about their own teaching but distrust the use of results for summative purposes". Referring to some of the previous research study results, he continues to write that "SEF has been labelled as a source of anxiety issues for faculty". "Such issues have led the faculty to question overall validity of evaluations and how the results are used or misused [Beran, 48]". "Negative perceptions of evaluations can lead faculty to discount their importance and eliminate the possibility of their role in improving teaching effectiveness [Theall & Franklin, 49]". Thus, Fulgham's study supports the perceived theory that teaching effectiveness has multidimensional aspects, and the evaluation for success should be done for achieving the best results for all parties [Fulgham, 11].

There is small amount of research in "health care education" too, which has focused on the benefits of using technology for assessment. These studies also are "suggesting heightened understanding of assessment method by students and provide a link with improvement in the quality of students' work" [McGuire, 18].

[Soub, 37]'s study, emphasizes on the possibility and probability of "evaluating of courses by students" dimension. In her study, she further comments on the fact saying that her "enquiry has brought up valuable information about higher education pedagogy that concerns the three fields" (activity, learning and learning effects) which naturally are also associated with teacher assessment too [Soubh, 37].

[Tugun, 38]'s study, underlines that some scales in assessing the proficiency perceptions and attitudes of the teachers in tablet-supported education do exist (p.1) with a reference list which also includes Tuan's study in 2000 ("The development of instrument for assessing students' perceptions of teachers' knowledge International Journal of Science Education 22(4), 385-398") which is rarely found in the literature [Tugun, 38].

A recent study [Chang, 05], focused on the comparison of 'consistency' and 'differences' among "teacher-assessment", "student self-assessment" and "peer-

assessment" in a web-based portfolio assessment environment for high school students. The results indicate that, significant differences exist among three assessment methods. The results for self-assessment and teacher-assessment were found consistent, but not among other pairs of methods used. Unfortunately, the research targeting learner category was limited with "students" only.

When assessing teachers from the principals/assistant principals' point of view; we also encounter research such as the one established by [Keskinoglu, 39], who emphasizes attention to issues such as "lecture time management" and "the need for a fair support to students according to their needs and learning characteristics" for an improvement need [Keskinoglu, 39].

Pellegrino's study on "The Evolution of Educational Assessment" [Pellegrino, 22] pays particular attention to the future of assessment, refers to the National Research Council (NRC)'s published volumes in USA. He underlines the importance of three major findings in these NRC volumes: which are "The implication, need and must for teachers to find out and work with the pre-existing understanding of the subject matter of their students bring with them", "teachers must cover some subject matter in depth, providing many examples in which the same concept is at work, to give students a firm foundation of factual knowledge", and "teachers need to use a meta-cognitive approach to instruction to help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them". The necessity is that "the teaching of meta-cognitive skills should be unified with the curriculum in a variety of subject areas". For teachers, he continues to emphasize the importance of "understanding and designing effective learning environments and the components that are contained therein". According to his study, powerful learning environments are focussed on four components which are "Knowledge, Learners, Assessments, and Community". Pellegrino, stresses the significance of "assessment" by clearly saying that "Assessment-centered elements help make thinking visible to students, teachers, and others in the learning community. Furthermore, these elements support an on-going process of work and revision that is focused on deepening understanding". Taking into account the effects of new technology uses in education (and naturally in assessment too – considering the expenditure of tools such as web based/mobile assessment), it is important to keep in mind his conclusions on a "mega-trend" which needs to be taken into account when imagining the future of educational assessments. Information technologies are everywhere, any time to reach and share data now. "The implications for assessment are profound. In 21st century learning environments, decontextualized, drop-in-from-the-sky assessments consisting of isolated tasks and performances will have zero validity as indices of educational attainments" [Page & Thomas, 21].

As stated in a PhD dissertation titled "Modelling the Structure of Information and Communication Technologies Integration into Learning and Teaching Process", clearly indicates that, literature review shows using ICT tools (which recently keeps populating on web-based/mobile tool use for assessment) is mostly focused on "teacher use" but not for a perspective of "assessing teacher performance by students". The study, underlines this conclusion by referring to various researchers' study results i.e. "(McNabb, Valdez, Nowakowski and Hawkens, (1999); Van Braak and fri. (2004), Russell and fri., (2003); Mumcu and Usluer, (2010); Hsu, (2010); and Ward and Parr, (2010)" [Uslu, 33].

On the other hand, [Sakar, Gokbay & Karahoca, 40]'s research on computer assisted learning (CAL) for some manufacturing studies; involves finding out the "readiness for learning" of students. This study includes subscales involving issues such as (motivation, health, reading, writing, listening, note taking, course attending, course preparation, attending an exam and grade point average (GPA) of the students. But, although the study involves a lot regarding to the teachers' setup, teacher preparation, teacher supervision and guidance activities performance; the subscales includes no elements for assessing the teacher in any one of these diversities [Sakar, Gokbay & Karahoca, 40].

Even in disciplines such as Arts, the use of new technologies, introduces new approaches for the evaluation process. With less dependency to one single educational source (teacher), an increase in self-learning skills is valid and recently named as "computer assisted teaching in art education" [Zor & Tepecik, 41]. The researchers underlines the changing role of the teacher in this new approach, who should also be able to perform activities with the computer now; such as individualizing the teaching process, guiding the students (-which may also involve teacher & student usage of assessment tools) and provide exercises and repetitions in the teaching-learning processes (p.5) [Zor & Tepecik, 41].

In [Byker, 42]'s study; the importance of students participatory role in the classroom was studied and it was named as "Student Voice". The research dealt with issues and practices for integrating digital technology to Student Voice. One of the three findings of the study was that "the candidates were more likely to describe elementary students' primary use of technology as 'using apps or software to practice subject-area skills' or 'playing educational games' than any other technology-rich activities" [Byker, 42].

2 The aim of this study

The aim of this analysis was to search and examine existing research studies based on various variables related to "web based/mobile assessment for teachers". Answers to the following questions were sought in this study:

1) What is the distribution of article numbers published based on the year of publication, with reference to the author, supporting/organizing university country origin, document type used, funding agency, written language used, research area, and source title?

2) Where do researchers from Turkey stand in the scale of research for "web based or mobile assessment tools?"

2.1 Data collection

All published open access research articles, which were related with "web based OR mobile teacher assessment" in the Web of Science indexed databases were included in this content analysis research study. In order to view the whole historical continuum, no date limitations were used in the search. According to the findings, 1330 research articles were reached and their content analysed. For the research of thesis level work, open PhD studies from YOK Tez Merkezi (6), PQDT Open (15), OADT Org (3), and EthOS (3) were also downloaded for further analysis with the key words match in the

title. Nine additional article studies matching the same search criteria was found as well, from "Google Academics" indexed search for extending and accessing more from the web category.

2.2 Content analysis criteria

Keywords: The criteria for content analysis, search keywords of the study were "web based" OR "mobile" AND "teacher assessment" only. According to the characteristics of the Web of Science indexed database; since no PhD level research exists there, this level of search was done via YÖK Tez Merkezi (http://www.yog.gov.tr), PQDT Open, OADT Org, and EthOS databases search. The keywords selected for filtering the search results in order to establish a fine content analyse of the statistics were publication year, authors, countries/territories, document types, funding agencies, languages, research areas and source titles.

2.3 Data analysis

After achieving the search results, all the gathered data were recorded in a database of SPSS 20.0 program. This database was then formed based on the determined criteria and then was analysed by the SPSS software. The examination was based on content analysis, and frequency and percentage analysis were applied. Additional analysis is done by Web of Science Search Results Tools in order to achieve some of the sub-dimensional properties of the filtered results.

3 Result

Distribution of the number of research articles on "web based/mobile assessment" with reference to the publication year of the study.

In Figure 1, distribution of the research articles published based on the year of publication is demonstrated. Despite the years earlier then 2010 (which has random fluctuation of numbers in research publications), as it can be seen, the increase in numbers is very clear throughout the years since 2010, with bursting percentage figures over 10% at 2014, 2015 and 2016.

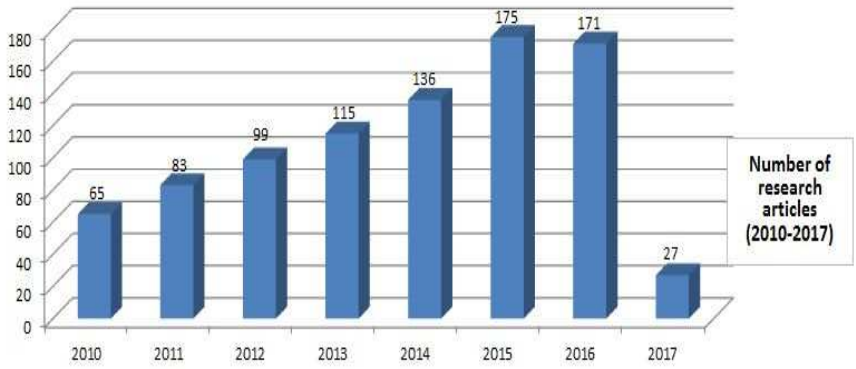

Figure 1: Publication year

Distribution of the number of research articles on "web based/mobile assessment" with reference to the author.

Authors	**Frequency (f)**	**Percentage (%)**
Chang C.C.	17	1.27
Boushey C.J.	10	0.75
Delp E.J.	10	0.75
Wang T.H.	8	0.60
Kraauenhagen R.A.	7	0.52
Kim S.	6	0.45
Li J.	6	0.45
Taki, M.	6	0.45
Tseng, K.H.	6	0.45
Chen, Y.H.	5	0.37

Table 1: Documents by author

As it can be seen from Table 1 which demonstrates the top authors on this subject; the leaders are Chang, C.C., Boushey, C.J. and Delp, E.J., with close followers (such as Wang, T.H., Krauenhagen, R.A.) with near publications.

Table 1 shows no Turkish author names among the top list, and Table 2 clearly indicates that most countries, including Turkey either has publications below 20 or has percentages below 1.5% for the "country of publications author" variable. This information shows that Turkish researchers and Turkey are clearly not within the leading group of authors and countries on publishing research in this area.

The "author" variable was used, only to see if any/or some Turkish researching authors are present more in these studies then other Turkish researchers (relating with sub-aims Q2). And in case of any higher numbers of publications found, analyse if that may have reasons from authoring with teams/universities in foreign countries. This type of deeper analysis may have been valuable for the future studies in inspecting study area diversities covered, possible follow-up study paths available etc.

In fact, unfortunately together with the Table-2 (country of publications author), these results showed that Turkish authors does not reside in the top list in this areas and clearly are way down in the area of research publications in terms of numbers.

Distribution of the number of research articles on "web based/mobile assessment" with reference to the supporting/organizing universities country origin for the research.

Country	Frequency (f)	Percentage (%)
USA	403	30.30
UK	89	6.69
China	88	6.61
Australia	79	5.94
Taiwan	71	5.38
Germany	57	4.28
Canada	51	3.83
Italy	50	3.75
Spain	39	2.93
Netherlands	38	2.85
Japan	35	2.63
South Korea	34	2.55
France	30	2.25
India	25	1.88
Sweden	23	1.72
Greece	22	1.65
Finland	21	1.57
Switzerland	21	1.57
Portugal	20	1.50
Malaysia	19	1.42
Austria	18	1.35
Brazil	18	1.35
Turkey	18	1.35
Ireland	17	1.27
Denmark	16	1.20
Scotland	16	1.20

Table 2: Country of publications author

Table 2, demonstrates that universities from USA (30.30%) clearly takes the lead, with the rest of the universities from countries leaded by UK (6.69%), China (6.61%), Australia (5.94%) and Taiwan (5.38%) that have studied "web-based/mobile assessment" with publications. Most countries, including Turkey either has publications below 20 or has percentages below 1.5% for this variable.

Distribution of the number of research articles on "web based/mobile assessment" with reference to the document types.

Document type	Frequency (f)	Percentage (%)
Article	657	49.39
Proceeding Paper	486	36.54
Meeting Abstract	178	13.38
Editorial Material	11	0.82
Letter	8	0.60
Review	7	0.52
Book Review	4	0.30
News Item	3	0.22
Correction	2	0.15
Note	2	0.15

Table 3: Documents by type

Table 3, demonstrates that articles are the most preferred document type (49.39%) on "web-based/mobile assessment", followed by proceeding paper (36.54%), and meeting abstracts (13.38%). Review materials are very limited (0.52%) when compared with the articles.

Distribution of the number of research articles on "web based/mobile assessment" with reference to the funding agencies.

Funding agency	Frequency (f)	Percentage (%)
National Institutes of Health	9	0.67
National Natural Science Foundation of China	7	0.52
National Science Foundation	6	0.45
National Science Council in Taiwan	4	0.30
European Commission	3	0.22
European Community	3	0.22
National Cancer Institute	3	0.22
National Science Council of the Republic of China	3	0.22
NCI NIH HHS	3	0.22
Netherlands Organization of Health Research& Dev.	3	0.22
NSFC	3	0.22
World Health Organization	3	0.22

Table 4: Documents by funding agency

As it can be seen from Table 4 which demonstrates the listing of supportive funding agencies on this subject in the world; the agencies from China and Taiwan took place among the "most". A closer look to the Table clearly indicates that funding agencies from the "health" sector are more willing to support research in this area then others.

Distribution of the number of research articles on "web based/mobile assessment" with reference to the written languages used.

Language	Frequency (f)		Percentage (%)
English	1316		98.94
German	7		0.52
Spanish	3		0.22
French	2		0.15

Table 5: Documents by languages

Research area	Frequency (f)	Percentage (%)
Computer Science	364	27.36
Engineering	320	24.06
Educational Research	183	13.75
Telecommunications	108	8.12
Health Care Sciences	82	6.16
Environmental Sciences	76	5.71
Public Health	75	5.63
Psychology	50	3.75
Medical Informatics	45	3.38
Radiology Nuclear Medicine	39	2.93
Business Economics	34	2.55
General Internal Medicine	34	2.55
Psychiatry	30	2.25
Nutrition Dietetics	28	2.10
Chemistry	26	1.95
Information Science Library Sci.	26	1.95
Optics	26	1.88
Imaging Science	24	1.80
Neurosciences Neurology	24	1.80
Oncology	23	1.72
Life Sciences	23	1.65
Cardiovascular System	22	1.50
Substance Abuse	20	1.50
Surgery	19	1.42
Biochemistry	18	1.35
Material Science	18	1.35
Nursing	18	1.35
Science Technology other	18	1.35

Table 6: Documents by research area

In Table 5, the distribution of research articles on “web based/mobile assessment” are demonstrated with reference to the language used. As expected, English language takes the lead, followed by very few articles written in German, Spanish and French.

Distribution of the number of research articles on “web based/mobile assessment” with reference to the research area.

Distribution of the study numbers based on the research area is demonstrated in Table 6. As it can be seen from the table, "Computer Science" (27.36%), "Engineering" (24.06%), "Educational Research" (13.75%) and "Telecommunications" (8.12%) are the mostly studied subject areas with publication. Although not residing at the top, it is interesting to note that areas related with health and medicine also compose a big group in the list.

Distribution of the number of research articles on "web-based/mobile assessment" with reference to the source titles.

Source titles	**Frequency (f)**	**Percentage (%)**
Lecture Notes in Computer Science	26	1.95
Computers Education	19	1.42
Proceedings of SPIE	19	1.42
Journal of Medical Internet Research	16	1.20
Faseb Journal	13	0.97
Alcoholism Clinical and Experimental Research	12	0.90
American Chemical Society Paper Abstracts	11	0.82
JMIR MHealth and Uhealth	10	0.75
Procedia Social and Behavioral Sciences	9	0.67
Educational Technology Society	8	0.60
Edulearn Proceedings	8	0.60
Bioelectromagnetics	7	0.52
Computers in Human Behavior	7	0.52
IEEE Transactions on Education	7	0.52
British Journal of Educational Technology	6	0.45
ED MEDIA 2004 World Conference on Education	6	0.45
Telecommunications Vols 17	6	0.45
IEEE International Conference on Advanced Learning Technologies	6	0.45
International Conference on Computers in Education Vols I-II	6	0.45
Journal of Computer Assisted Learning	6	0.45
Radiation Protection Dosimetry	6	0.45
Studies in Health Technology and Informatics	6	0.45

Table 7: Source title

Distribution of the study numbers based on the source titles are demonstrated in Table 7. As it can be seen from the table, "Lecture Notes in Computer Science" (26%) and "Computers Education" (19%) are the sources that mostly studied this topic with publication. While health or medical oriented sources are close followers, Procedia Social and Behavioral Sciences (0.67%) with Educational Technology Society (0.60%) following the line.

4 Discussion and conclusion

Similar to Kozikoglu's recent study [Kozikoglu, 16], based on challenges faced by "teachers" which showed a clear increase in the number of publications since 1997, this research too shows that the number of published research in this area is increasing day by day. In this increase, the number of research publications coming from Turkey should have also increased. However, although as [Sert and Boynuegri, 28] mentions about the reality of Turkey today by stating that "...Turkey has 47.339.020 Facebook, 35.359.000 internet, 28.566.650 twitter, 12.242.850 instagram, 23.669.510 Google users (Onedio,2015) most of whom are young people (ERI, 2013)." They also underlines that "they use technology for variety of purposes such as life styles, music, news and so forth (Dogramaci & Radcliffe ,2015)"; no evidence for the usage of web-based/mobile assessment tools for assessing teachers are mentioned (pp.30-31). [Keser, 15]'s study as well, which aimed to determine the distance education teacher candidates' opinion about the efficiency of virtual classes; showed that the students were mostly satisfied by the efficiency achieved in classes and when criticizing the system, haven't drawn any conclusions or suggestion including proposals for trying a web-based/mobile assessment tool. Although diverse and promising research studies does exist in the recent years from Turkey such as [Kortak, 44] and [Bolukbasi, 45], they are not many in this field of study and figures has not yet been tracked to high publication numbers from Turkish universities yet.

In studies of this field, United States seems to be in the leader country position among all the participating countries. Recently done in-depth analysis examples by researchers from USA universities keeps increasing in fact, some focusing on valuable diversities such as "Effectiveness of m-assessment for improving learning" and "challenges of using m-assessment" [Sahin & Dominic, 43].

Britain and Australia are the following countries. But research from China and Taiwan universities appears to be among the top group and gaining elevation [Chen, 46], [Sung, Chang & Liu, 47]. Turkey's total research publications on this subject, have only reached 1. 5% of the total publications.

The most intensive publication-type on the 'web-based / mobile assessment' is articles (about half of the total publications). This is followed by 'conference notifications' and 'meeting summaries'. This can be regarded as a sign of the fact of a growing number of conference reports being published on this issue: This of course, can be regarded as a positive development.

Outside the United States, China and Taiwan are now among the countries that are most supportive of the work in this area. The 'target concentration' in the "health sciences" sector may also be an interesting indicator. This may be viewed as a demonstration that scientific research on the use of "web-based / mobile assessment tools" is and can be more concentrated in 'medical and healthcare' areas. Investigation of these assumptions may give valuable results about the reasons of it, and possible evaluation of the results achieved may be a useful for future studies.

Another fact this research showed that is, 'English' is used in a large concentration as the fundamental language for writing the documents researched. This result may be due to the need to internationalizing the documents.

It can be seen natural that the fields of research such as 'Computer Science' and 'Engineering' have the most intensive interest. However, the 'education' sector is

following this group, and reaching to a rate of approximately 13.7% of total publications. This may be a reflection of the fact that scientific studies in this area are in a position not to be underestimated.

Results on this subject also shows that, although research publications for each distinct medical or health related application area have not reached to separate high rates in the scale, total publications on 'Medicine' and 'health' area applications research has reached to higher values.

In parallel with the distribution of the sectors that receive the most attention in the "web-based/mobile evaluation" application fields and support, the research activities the most, the sources that make most of these publications are 'Lecture Notes in Computer Science' (26%) and 'Computers Education' (19%) naturally. Despite health and medical oriented research studies closely following the top "computer-based" related work groups of publications; it is interesting to note that the ever-growing and strengthening sources such as 'Procedia Social and Behavioural Sciences' and 'Educational Society' from the education sector, has only produced publications in the ratio of 0.6% of the total.

5 Suggestions

[Tugrul, 31] clearly underlines the need for research in this area by saying that "One of the challenges of the current digital landscape of higher education is choosing and identifying the best use of Web 2.0 technologies while meeting changes in industry requirements and student expectations…therefore, more research needs to be conducted to explore the use and efficacy of social networking technologies applied to digital natives to supplement traditional classroom learning". The causes of scarcity in relation to the use of 'web-based assessment tools' for different levels of education, different sectors and disciplines in the world and especially in Turkey, may be a subject of further researches as a whole. When the results of such work are shared, they may provide valuable information for researchers working on these issues.

The use of 'web-based / mobile evaluation tools' for teachers can be researched for different directions, such as the dimensions of 'teacher's assessing student work' and 'student's assessing teacher's work' separately and in a comparative manner. Such studies may provide useful resources for teacher and student self-assessment studies, especially in the faculty of teacher training of universities.

Referring to results shown in Table-4, Table-6 and Table-7, since studies on web-based of mobile assessment use in "Medicine and Health Sciences" is receiving more attention, more funds, more research and diversity in developed countries, similar

researches can be conducted in developing countries as well on topics related to the use of 'web-based evaluation tools' by faculty and teachers in faculties, the existing ones can be supported, and this area can find incentives to use the experiences in the world which has a positive trend.

References

[Ahamer, 01] Ahamer, G.: A short history of web-based learning including GIS, International Journal of Computer Science & Emerging Technologies (E-ISSN: 2044-6004), Volume 1, Issue 4, December, 2010.

[Behnke, 02] Behnke, K.A.: Gamification in Introductory Computer Science, Doctoral Thesis, University of Colorado, Atlas Institute, 2015.

[Beran, 48] Beran, T., Violato, C., & Kline, D. : What's the 'use' of student ratings of instruction for administrators? One university's experience. Canadian Journal of Higher Education, 17(1), 27-43, 2007

[Berigel, 03] Berigel, M.: Investigating Adoption of Instructors to Distance Education Environment, Doctoral Thesis, Black sea Technical University, Trabzon, Turkey, 2013.

[Bolukbasi, 45] Bölükbaşı, M.: Comparing Qualifications by Using a Mobile Supported Evaluation and Assessment Tool. Master Thesis, Graduate School of Natural and Applied Sciences, Department of Informatics, Yüksek Lisans Tezi, MUĞLA SITKI KOÇMAN University, Turkey, 2015

[Byker, 42] Byker, E.J., Putman, S. M., Handler, L., & Polly, D.: Educational technology and student voice: Examining teacher candidates' perceptions. World Journal on Educational Technology: Current Issues. 9(3), 119-129, 2017

[Chan, 04] Chan, K.K.: Students' perceptions of learning through assessment for learning and technology. Durham theses, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/1912/, 2007

[Chang, 05] Chang, C.C., Tseng, K.H., Lou, S.J.: A comparative analysis of the consistency and difference among teacher-assessment, student self-assessment and peer-assessment in a Web-based portfolio assessment environment for high school students. Computers & Education, 58 (2012), 303-320. https://doi.org/10.1016/j.compedu.2011.08.005

[Chen, 46] Chen, C.: The implementation and evaluation of a mobile self- and peer-assessment system. Computers & Education 55 (2010) 229–236.

[Coulby, 06] Coulby, C., Hennessey, S., Davies, N. and Fuller, R.: The use of mobile technology for work-based assessment: the student experience, British Journal of Educational Technology, Vol 42, No 2, 2011, pp.251-265, doi:10.1111/j.1467-8535.2009.01022.x

[Croteau, 07] Croteau, W.: Online Formative Assessments as Predictors of Student Academic Success, Doctoral dissertation, Walden University, College of Education, Education Technology, 2014.

[Dahalan, 08] Dahalan, H.M., Hussain, R.M.R.: Development of Web-Based Assessment in Teaching and Learning Management System (e-ATLMS), Procedia Social and Behavioral Sciences, 9 (2010), pp.244–248.

[Dhir, 09] Dhir, A., Gahwaji, N.M., and Nyman, G.: The Role of the iPad in the Hands of the Learner, Journal of Universal Computer Science, vol. 19, no.5 (2013), 706-727, pp.714-715

[Fan, 10] Fan, Y.C., Wang, T.H. and Wang, K.H.: A Web-based model for developing assessment literacy of secondary in-service teachers. Computers & Education.57 (2011), 1727-1740

[Fulgham, 11] Fulgham, J.C.: An investigation of faculty perceptions of the use of student evaluation of faculty instrument, Doctoral Dissertation, Mississippi State University, 2014, pp.28-29

[JISC, 12] JISC: Effective Practice with e-Assessment, Higher Education Funding Council for England (HEFCE), www.jisc.ac.uk/assessment.html, 2007

[Karch, 13] Karch, K.: An Investigation of Perceptions About Smart Mobile Phone Usage As An Instructional Tool in A High School Classroom, Doctoral dissertation, Capella University, 2014.

[Kasapcopur, 14] Kasapçopur, A., Akgül, K., Doğan, H.A.: Institutional & individual performance assessments in web-based Kindergarten. Procedia Social and Behavioral Sciences, 9 (2010), pp. 363–368.

[Keser, 15] Keser, H., Bicen, H. & Caliskan, S.: Determination of teacher candidates' opinion about the efficiency of virtual classes used in distance education. Global Journal of Information Technology: Emerging Technologies, Volume 06, Issue 2, (2016) 143-148

[Keskinoglu, 39] Keskinoglu, D., A.: The evaluation of teachers time management skills in class by the principals view, *International Journal of Innovative Research in Education, 3*(2), 69-85, 2016

[Kortak, 44] Kortak, M.E.: Web-Tabanlı Akran Ve Öz Değerlendirme Sisteminin Tasarlanması Ve Geliştirilmesi. Thesis for Doctoral Dissertation, Institute of Educational Sciences, Dumlupınar Üniversitesi, Kütahya, Turkey, 2014

[Kozikoglu, 16] Kozikoglu, I.: A content analysis concerning the studies on challenges faced by novice teachers. Cypriot Journal of Educational Sciences. 12(2), 91-106, 2017

[Kruger, et al., 17] Kruger, D., Inman, S., Ding, Z., Kang, Y., Kuna, P., Liu, Y., Lu, X., Oro, S., and Wang, Y.: Improving Teacher Effectiveness: Designing Better Assessment Tools in Learning Management Systems, Future Internet ISSN 1999-5903, http://www.mdpi.com/journal/futureinternet, 2015, 7, 484-499; doi:10.3390/fi7040484.

[McGuire, 18] McGuire, L.: Assessment using new technology. Innovations in Education and Teaching International, 42, 3, pp.265–276, 2005

[Ozdamli, 19] Özdamlı, F., Tavukcu, T.: Determination of Secondary School Students' Attitudes towards Tablet PC Supported Education, Journal of Universal Computer Science, vol. 22, no. 1 (2016), 4-15, pp.6-7

[Oz, 20] Öz, H.: Pre-service English teachers' perceptions of web-based assessment in a pedagogical content knowledge course. Procedia – Social and Behavioral Sciences, 141(2014), pp.45-58

[Page & Thomas, 21] Page, T.G., and Thomas, J.B., (1979): International Dictionary of Education. London: Kogan Page, pp.26-27

[Palma, 36] Palma, R., Russo, C. & Egizio, F.: A better school organizational performance? Yes, but how? Contemporary Educational Researches Journal. 7(1), 35-43, 2017

[Pellegrino, 22] Pellegrino, J.W.: The Evolution of Educational Assessment: Considering the past and imagining the future, Educational Testing Service, Policy Evaluation and Research Center, Policy Information Center, Princeton, 2004

[Prasertcharoensuk & Tapkawa, 23] Prasertcharoensuk, T. and Tapkawa, N.: Schools, Parents and Community Partnership Enhancing Students' Learning Achievement. Contemporary Educational Research Journal, Vol 6, No 1 (2016), pp.30-39

[Sahin & Dominic, 43], Şahin, F & Dominic, M.: Using Mobile Phones for Assessment in Contemporary Classrooms, Chapter: 06, Publisher: IGI Global, Editors: Dominic Mentor, pp.116 – 138. https://www.researchgate.net/publication/305083913

[Said, 24] Said, A-H, N.: Effective College Teaching and Students' Ratings of Teachers: What Students Think, What Faculty Believe, and Had Actual Ratings Show Implications for Policy and Practice in Teaching Quality Assurance and Control in Higher Education in OMAN, Durham theses, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/649/, 2011

[Sainsbury & Walker, 25] Sainsbury, E.J., and Walker, R.A.: Assessment as a vehicle for learning: extending collaboration into testing. Assessment & Evaluation in Higher Education, 33(2), pp.103-117, 2007

[Sakar, Gokbay & Karahoca, 40] Şakar, B., E., Gökbay, İ., Z. & Karahoca, A.: Assessment of readiness for learning and academic success on computer assisted learning: A study on computer integrated manufacturing with lathe. Global Journal of Information Technology. 6(1), 94-106, 2016

[Sano, 26] Sano, A.: Measuring College Students' Sleep, Stress, Mental Health and Wellbeing with Wearable Sendors and Mobile Phones. Doctoral Thesis, Massachusetts Institute of Technology, 2016.

[Scanlon, 27] Scanlon, G.: Technology Supported, Self-Directed Learning: An Investigation of Blended Learning and Online Assessment on a Pre-Service Teacher Education Programme. Degree of Master of Arts (ICT in Education).University of Limerick, May 2010.

[Sert & Boynuegri, 28] Sert, N., and Boynuegri, E.: Digital technology use by the students and English teachers and self-directed language learning. World Journal on Educational Technology: Current Issues, Vol 9, Issue 1, (2017) 24-34

[Solomonidou, 29] Solomonidou, G.: A Mixed Methods Investigation Into The Perceptions of Lower Secondary School Students and Teachers in Cyprus on The Purposes and Approaches of Assessment, Doctoral Thesis, School of Education, University of Leicester, 2014.

[Soubh, 37] Soubh, F.Z., Aitdaoud, M., Lima, L. & Talbi, M.: Measuring learning quality by Moroccan university students. International Journal of Learning and Teaching. 9(1), 298-307, 2017

[Sung, Chang & Liu, 47] Sung, Y.T., Chang, K.E., Liu, T.C.: The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. Computers & Education 94 (2016) 252-275

[Taras, 30] Taras, M.: Assessment for learning: understanding theory to improve practice, Journal of Further and Higher Education, 31(4), pp.363-371, 2007

[Theall & Franklin, 49] Theall, M. & Franklin, J.: Looking for bias in all the wrong places: A search for truth or a witch hunt in student ratings of instruction. New Directions for Institutional Research, 45-56. San Francisco: Jossey-Bass, 2001

[Traxler, Barcena & Laborda, 34] Traxler, J., Barcena, E., & Laborda, J., G.: Mobile Technology for Foreign Language Teaching: Building Bridges between Non-formal and Formal Scenarios, Journal of Universal Computer Science, vol. 21, no. 10 (2015), 1234-1247

[Tugrul, 31] Tugrul, T.O.: Perceived learning effectiveness of a course Facebook page: teacher-led versus student-led approach. World Journal on Educational Technology: Current Issues, Vol 9, Issue 1, (2017) 35-39

[Tugun, 38] Tugun, V.: Validity and reliability dissertation of the scale used for determination of perceptions and attitudes of teacher's proficiency in tablet pc-supported education. Cypriot Journal of Educational Science. 11(2), 51-57, 2016

[Tufekci, 32] Tufekci, A.: Evaluation of Turkish "E-Okul" System in Terms of Usability, Journal of Universal Computer Science, vol 19, no. 5 (2013), 639-657, pp.641-642

[Uslu, 33] Uslu, N.A.: Modeling the Structure of Information and Communication Technologies Integration into Learning and Teaching Process. Thesis for Doctoral Dissertation. Department of Computer Education and Instructional Technology, Hacettepe University, Ankara, Turkey, 2013

[Zor & Tepecik, 41] Zor, A. & Tepecik, A.: New approaches in art education and the use of technology. Global Journal of Arts Education, 5(1), 01-09. Doi: http://dx.doi.org/10.18844/gjae.v5i1.13, 2015